

of infested ginger; that the market contained no infested ginger so far as he had found; and that other kinds of ginger than *Hedychium coronarium* including the red ginger of Fiji, another species with cone-shaped flowers and still another low form, probably a native species, were examined and no trace of infestation found. After some discussion, it was voted that the report be accepted in course and in view of the prevailing opinion that the pest might be eradicated if prompt and vigorous action were taken, the Secretary was instructed to address the Superintendent of Forestry asking the coöperation of the Board of Agriculture and Forestry to this end, stating at the same time that whatever assistance could be rendered by individual members of the Entomological Society would be gladly given.

Messrs. Swezey and Fullaway were appointed a committee to prepare a memorial for Mr. H. O. Marsh, a former member whose death had recently been noted.

#### PAPERS.

### **New Hawaiian Delphacidae (Homoptera).**

BY F. MUIR.

The list of Hawaiian Delphacidae has been considerably increased during 1918. This is chiefly due to the activities of Messrs. Bridwell, Fullaway, Giffard, Rock and Swezey. In the present paper eighteen new species, one new sub-species and two new varieties are described, but a considerable portion of the collected material has not yet been worked, chiefly consisting of a collection made by Mr. W. M. Giffard in Hawaii. This latter material contains several new species. An extension of localities has been noted for several species, and the food plants of most of the new species and of some of the old ones are recorded. The taking of *Nesodryas laka* (Kirk.) and *Ilburnia monticola* (Kirk.) is of interest as no specimens of

these two species existed in the collections in the Territory. The finding of more specimens of *I. osborni* (Muir) shows that the aedeagus of the single specimen from which the species was described was damaged. The *cyathodes* group shows some interesting features for here we have certain chroitic changes, which in other groups of Delphacidae are of generic value, while the genitalia remain practically unchanged.

All the new species show as great a phallic differentiation as the old. In this question of phallic differentiation lies the chief problem of the evolution of the Delphacidae, especially of the evolution of species. Work done by Mr. Giffard on North American Delphacidae shows the same diversity of the genitalia as I have found among the Hawaiian and Oriental species.

Mr. Timberlake made dissections and mounts of his own material and that of Mr. Bridwell, and Mr. Giffard prepared mounts and drawings of the material collected by himself, and Messrs. Fullaway and Rock, so that to a large extent I am only the recorder of these new species.

The types are all deposited in the collection of the Hawaiian Sugar Planters' Association, Honolulu. Measurements are from the apex of vertex to the anus and from the base to apex of one tegmen.

The generic name *Ilburnia* has been used in place of the better known *Nesosydne*, but the change is unavoidable.

#### KELISIA Fieb.

*Kelisia eragrosticola*, n. sp. Pl. IV, f. 2.

Male. Brachypterous; length 2.6 mm.; tegmen 1 mm. Vertex slightly longer than the width at base, apex slightly conically produced, narrower than base, sides straight, converging towards apex, the Y carina obscure, the diamond-shape cell not reaching the apex; length of face about twice the width, widest about the middle, median carina simple; antennae reaching about the middle of clypeus, first joint half the length of the second. Pronotum about as long as vertex, lateral carinae straight and slightly diverging to near hind margin, then slightly converging and reaching the hind margin. Tegmina not reaching to the middle of abdomen. Hind tibiae longer than tarsi, first tarsus subequal to the other

two together. Spur slightly shorter than the first tarsus with many small teeth on the hind margin.

Opening of pygofer large, deeply emarginate on ventral edge, less deeply on dorsal edge, and segment fitting into dorsal emargination, short, each ventral corner produced into an apically truncate spine; genital styles strongly curved, slightly flattened, broadest on basal half, apex bluntly pointed, aedeagus subcylindrical, flattened and curved on apical half, apex rounded, orifice on outer side of the curve near apex, a row of small teeth along the apical half continuing along the right side, the teeth on the dorsal aspect near the middle forming a small comb, on the ventral aspect near the end of the row of teeth are some teeth forming a small, irregular comb curving to the left side.

Pale orange yellow, pale or whitish over the carinae of pro- and mesonotum and continued as three marks down the dorsum of abdomen with an outer light line on pleura of abdomen, carinae of vertex and face light, between carinae more or less fuscous, darkest along the carinae, two irregular, longitudinal dark marks down antennae, two longitudinal brown marks on femora and tibiae, genital styles, ventral portion of anal segment and middle of diaphragm brown. Tegmina pale orange yellow, veins slightly lighter than membrane, granules very obscure, a few small, black hairs, a small black mark on hind margin at apex of clavus.

Female. Brachypterous; length 3.1 mm.; tegmen 1 mm. Similar in color to the male.

Macropterous; length 3.3 mm.; tegmen 3.3 mm. Apical veins brownish and a dark mark on the hind margin at apex of clavus; wings with brown veins.

Habitat. Iao Valley, Maui. (Giffard and Fullaway, May, 1918) on *Eragrostis variabilis*. One male from the same locality and food plant (Bridwell, August 1918).

Described from forty-seven males, fifty females and a few nymphs. The nymphs show the three longitudinal pale marks very distinctly and are inclined to be slightly darker than the adults.

The genitalia of this species are of interest as they show the transmission from *K. swezeyi* and *K. sporobolicola* to *K. emolosa*.

**K. sporobolicola** Kirk. Pl. IV, Fig. 13.

Previously I figured the left side of the aedeagus of this species\* but as the chief row of spines are on the right side I

\* Proc. Haw. Ent. Soc., III:4, Pl. V, f. 21 (1917).

now figure that aspect. A long series from Puu Nianiau, Haleakala, Maui, about 7000 feet elevation (*J. C. Bridwell*, August 1918) on *Eragrostis atropioides*. One of these is a macrop-terous female. In general color they are darker than the average Oahu specimens.

#### LEIALOHA Kirk.

##### *Leialoha lehuae mauiensis*, n. var.

In coloration this is near to *L. lehuae hawaiiensis* and it varies in the same manner. The aedeagus is closely related to it as well, but has no small spine at the apex but one near the apex of the crook.

*Habitat.* Olinda, Maui, 4200 feet elevation (*Giffard* and *Fullaway*, May 1918) on *Coprosma montana*. Four males, three females and thirteen nymphs. This is the first *Leialoha* taken on Maui.

#### NESODRYAS Kirk.

##### *Nesodryas fletus* (Kirk.)

One female from Lupe ditch, Maui (*Giffard* and *Fullaway*, May 1918) on *Antidesma platyphyllum*. The marks on the face are darker and more distinct than usual.

##### *Nesodryas* (*Nesothoe*) *laka* (Kirk.)

One male, three females and two nymphs from ridge south of Iao Valley, Maui, 800 feet elevation (*Bridwell*, August 1918) on *Sida*. These conform fairly well to Kirkaldy's description which was made from one female, and are the only specimens taken since the type.

##### *N. (Nesothoe) munroi* Muir.

Nineteen males, thirty females and nymphs on *Dodonaea viscosa* var. *spathulata*, A-a flows, Kau, Hawaii, 3600 feet elevation (*Giffard*, July 1918).

##### *N. (Nesothoe) gulicki* Muir.

Twelve specimens on *Euphorbia* sp., Nuuanu Pali (*Giffard* and *Muir*, December 1918).

The figure of the aedeagus of this species\* is not very good. The orifice is at the apex, from the left edge of the orifice arises a small spine, a little basad and slightly more ventrad is a larger spine expanded at the apex with some small projections on the expanded portion, basad of this and on the right side there is a small spine curved distad and with a minute spine about the middle.

A long series from middle Puna, Hawaii, 750 feet elevation, on *Metrosideros collina polymorpha* var. *glaberrima*. Several specimens in this series are very light in color, especially some of the females in which most of the color on the tegmina is faded out. Also three specimens from 23 miles, Olaa, Hawaii. (*Giffard*, August 1918).

#### ALOHA Kirk.

##### **Aloha ipomoeae** Kirk.

A long series from the sea shore at Olowalu, Maui, some off of *Ipomoea pes-caprae* which are all light in color, and others on *Ipomoea pentaphyllum* which are all much darker in color. Three adults on *Ipomoea insularis* from Iao Valley, Maui, also belong to the dark variety (*Giffard* and *Fullaway*, May 1918).

Two males, five females and young on *Sesbania tomentosa* and one male and eight female on *Ipomoea pes-caprae*, from Momomi, Molokai (*Rock*, June 1918). These are all light forms.

#### ILBURNIA White.

##### **I. pseudorubescens** (Muir.)

Two male specimens from Olinda, Maui, 4200 feet elevation, one taken on *Lobelia* sp. and the other on *Acacia koa*, which I consider to be this species (*Giffard* and *Fullaway*, May 1918).

##### **I. tetramalopii** n. sp. Pl. III, f. 7, Pl. IV, f. 19.

Male. Brachypterous; length 1.6 mm.; tegmen 1.3 mm. Length of vertex nearly double the width, apex subconical, sides subparallel to near

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\* Proc. Haw. Ent. Soc., III (1916). Pl. 2, fig. 13.

apex, base about middle of eye; length of face 1.7 times the width, sides slightly <sup>py</sup>acute, median carina simple; antennae reaching a little beyond base of clypeus, first joint half the length of second; legs short, hind femora not reaching beyond apex of abdomen, tibiae longer than tarsi, first tarsus about equal to the other two together, spur as long as first tarsus. Tegmina reaching to eighth abdominal tergite.

Opening of pygofer large, about as long as broad, round, (in the figure the anal segment is shown greatly elevated and so the shape of the opening looks longer than broad, when the anal segment is in repose the shape of pygofer is more like that of *bridwelli*), dorsal emargination large, wide, embracing about half the anal segment, anal angles not produced; anal segment with two short spines on the under side not very near together; genital styles flat, broad, apex truncate with the angles slightly produced, outer and inner edges slightly concave; aedeagus flattened laterally, slightly curved, broadest in middle, considerably narrowed at apex which is produced into a small point, right side with three small, flattened spines, left side with two spines.

Dark auburn or black, antennae, carinae of head and thorax, between the carinae of pronotum and over the mesonotum, median portion of pygofer and seventh and eighth abdominal tergites pale orange; legs light with longitudinal markings on femora and tibiae, apical tarsi dark. Tegmina opaquely or milky white, veins whitish with black granules bearing black hairs, a black mark at apex of clavus. The opaque whiteness varies, the membrane in some specimens being clear with brownish markings.

Female. Brachypterous; length 2 mm.; tegmen 1.1 mm. In color the female is generally lighter than the male.

*Habitat.* Haleakala (near the summit), Maui, 7000 feet elevation (*Bridwell*, August 1918) on *Tetramolopium kumile*.

Described from fourteen males, fourteen females and twenty nymphs. The nymphs are light in color with darker markings somewhat similar to the adults but not so extensive, the tegminal pads are mostly all dark.

This species is very distinct and I cannot place it very near to any other species at present.

#### ***I. argyroxiphii* (Kirk.)**

I have not seen a male of this species. A female specimen taken by Swezey at the same time as the male figured by Kirkaldy\* has the following dimensions:

Length 3.0 mm., tegmen 1.2 mm.; length of vertex 1.3

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\* Proc. Haw. Ent. Soc., I. Plate 4, fig. 6.

times the width, slightly widened towards the apex which is slightly rounded, base slightly in front of the middle of eye; length of face twice the width, sides slightly curved, median carina simple; antennae reaching slightly beyond the base of clypeus, first joint half the length of second. Tegmina reaching base of fifth segment; hind femora considerably longer than tarsi, first tarsus longer than the other two together.

It is possible that this comes into the same group as *I. bridwelli* and *I. tetramalopii* but there are several distinct differences in structure.

***I. monticola* (Kirk.) Pl. IV, f. 10.**

Vertex slightly longer than wide, apex slightly and broadly conical; length of face more than twice the width, median carina simple; antennae reaching to the base of the clypeus or slightly beyond, first joint about half the length of second.

The genitalia are close to those of *I. leahi* (Kirk.); the pygofer is slightly narrower, the anal spines large and diverging with a lobe from the anal segment basad of the spines, the genital styles are bent slightly more in the middle than is the case in *I. leahi*; aedeagus figured.

A long series of both sexes and nymphs from Haleakala, Maui, 7000 feet elevation, (*Bridwell*, August 1918) feeding on *Coprosma montana*.

***I. rubescens* (Kirk.)**

Five males and one female, Haleakala, Maui (Pun Nianian) on the phyllodia of *Acacia koa* (*Bridwell*, August 1918).

***I. bridwelli* n. sp. Pl. III, f. 3, Pl. IV, f. 20.**

Male. Brachypterous; length 2 mm.; tegmen 1.5 mm. Length of vertex nearly double the width (1 to 1.9), sides subparallel, apex slightly conical, base well behind the middle of eye; length of face nearly two and one-half the width (1 to 2.4), sides slightly curved, median carina simple; antennae reaching slightly beyond base of clypeus, first joint half the length of second; hind femora not reaching beyond apex of abdomen, hind tarsi nearly equal in length to the tibiae, first hind tarsus equal to the other two together, tegmen reaching to anal segment.

Opening of pygofer large, wider than long, sides well rounded, dorsal emargination large, embracing about half the anal segment; spines on anal segment large, stout, not near together; genital styles flat, broad, widest at apex which is truncate with the lateral angles produced, narrowest in middle, (in a flat, lateral view the narrowness is not so great); aedeagus flattened laterally, rounded at apex, functional orifice near apex

on ventral aspect, three small curved spines near middle of dorsal aspect and one smaller spine more distad on right and two on the left side.

Black or brown; antennae, carinae of head and thorax lighter, legs brownish with darker longitudinal marks, apical tarsi brown, base of abdomen, dorsal aspect and edges of pygofer and a narrow stripe down abdominal dorsum yellowish or light brown. Tegmina hyaline slightly opaque or milky white with slight infuscation over the middle area veins concolorous as membrane with black granules bearing black hairs, a dark mark at apex of clavus and another at apex of costal cell and at apex of cubitus.

Female. Brachypterous; length 2.4 mm.; tegmen 1.7 mm. In color lighter than the male, being light brown. One female, perhaps immature, being yellow with tegmina immaculate except for the black granules which are very small.

*Habitat.* Haleakala, Maui, about 7000 feet elevation (near the small crater of Puu Nianian) on *Argyroxiphium virescens*. (Bridwell, August 1918). Described from two males, four females and one nymph. The nymph is dark brown, lighter on carinae, at base of abdomen and mottled over tegminal pads.

This species comes near to *I. tetramalopii*.

#### ***I. cyathodis* (Kirk.)**

The forms associated under this species are of great interest as among them we have considerable chroötic but practically no phallic differences. Among continental faunae the differences found in such a form as *ecke* would be considered as of generic value, judging by some of the European and American genera. But as my studies of Hawaiian Delphacidae have been primarily based upon the genitalia, and as there is no doubt as to the close affinity of the forms in question, I prefer to associate them under *cyathodis* as subspecies and varieties.

After examining the new material from Maui I consider *fullawayi* as of only varietal value. The five forms I now class as follows:

- Ilburnia cyathodis* (Kirk.)
- var. *fullawayi* (Muir)
- var. *lauaiensis* (Muir)
- var. *nigrinervis* Muir
- subspecies *ecke* Muir.



**1. *cyathodis nigrinervis* n. var.**

Male. Brachypterous; length 1.5 mm.; tegmen .6 mm. Vertex as long as broad, apex slightly roundly produced, sides parallel, base in front of the middle of eye, head nearly as broad as thorax; length of face twice the width, median carina simple; antennae reaching barely to base of clypeus, second joint 2.6 times the length of first, first about as long as broad; hind femora not reaching beyond the apex of abdomen; tibiae longer than femora, tarsi equal to tibiae, first tarsus equal to the other two together; tegmina reaching to base of sixth segment.

Light brown over face and vertex, darker over apical portion of face and over clypeus, dark brown on thorax and black over abdomen. Tegmina hyaline, slightly opaque and faintly fuscous or brownish over the greater area, the apical cells clearer, all the veins fuscous or brownish. Fine, short hairs sparsely cover the head, thorax and abdomen, more perceptibly so on the face.

Female. Brachypterous; length 1.9 mm.; tegmen .9 mm.; in color lighter than the male.

*Habitat.* Haleakala, Maui (*Swezey*, August 1918) on *Cyathodes* sp. Described from thirteen males and sixteen females. There is one male specimen in the Bridwell collection from the same locality (7000 to 8000 feet elevation) on *Staphylea grayana* (*Cyathodes*).

**1. *cyathodis lanaiensis* (Muir.)**

Three males, four females and a nymph from Iao Valley, Maui, (*Bridwell*, August 1918) on *Cyathodes* sp.

**1. *cyathodis eeke* n. subsp.**

Male. Brachypterous; length 2 mm.; tegmen .8 mm. Vertex slightly longer than broad (1 to 1.20), sides parallel, apex slightly rounded, base about middle of eyes; length of face twice the width; head nearly as wide as thorax; antennae reaching to base of clypeus, second joint 1.2 times the length of first, lateral carinae of pronotum straight, slightly diverging, reaching hind margin. Tegmina reaching to middle of fourth abdominal segment.

Head, thorax and legs dirty pale yellow orange, fuscous between carinae of head; dark, longitudinal marks on legs, abdomen black. Tegmina dirty pale yellow orange, veins without granules with very fine light hairs.

Female. Brachypterous; length 2.3 mm.; tegmen .8 mm. Similar in color to the male but abdomen often lighter.

*Habitat.* Mount Eeke, West Maui, 5000 feet elevation (*J. Rock*, August 1918) on *Argyroxiphium* sp.

Described from thirteen males and nine females. There is some little variation in color, the marks on the legs fading out entirely.

The genitalia of this subspecies is the same as in *I. cyathodis*, otherwise it differs in having a longer and narrower vertex, the tegmina are much shorter and the whole insect is proportionally longer and narrower.

***I. longipes* n. sp.** Pl. III, f. 4; Pl. IV, f. 15.

Male. Brachypterous; length 2.3 mm.; tegmen 1 mm. Vertex longer than broad (1 to .8), sides subparallel, apex truncate, length of face more than twice the width (2.25 to 1) slightly broadened on apical half, median carina simple but slightly thickened on basal third; antennae reaching to middle of clypeus or beyond, basal joint very slightly shorter than apical joint; legs long, hind femora reaching beyond apex of abdomen, tibiae considerably longer than femora, tarsi considerably shorter than tibiae, first joint very slightly longer than other two, spur considerably shorter than first tarsus. Tegmina reaching to middle of abdomen.

Opening of pygofer about as long as wide, each anal angle of pygofer produced into rounded process which nearly meet in middle line and nearly surround the anal segment; anal segment without spines; genital styles slightly curved, narrowed in the middle, apical half subdiamond shape; aedeagus tubular, orifice at apex slightly ventrad, two small flanges at base on dorsal aspect, three large spines on dorsal aspect near apex; diaphragm produced into a ridge in middle with a shagreened surface.

Mustard yellow, fuscous between carinae of face and on gena forming two narrow lines on face and continuing onto the apical portion of vertex, brownish between carinae of thorax, on medio-lateral portion of abdomen, apex of labium and claws. Tegmina hyaline, light mustard yellow, veins darker, the subcostal, claval and middle of the median and cubital cells brownish, a darker mark running over the membrane from base of subcostal cell to apex of clavus; granules very sparse and minute bearing black hairs.

Female. Brachypterous; length 2.7 mm.; tegmen 1.3 mm. Similar in coloration to male.

*Habitat.* Olinda, Maui, 4200 feet elevation. (*Giffard* and *Fullaway*, May 1918) on *Cyrtandra mauiensis*. Described from three males and one female.

***I. coprosmae* n. sp.** Pl. III, f. 2; Pl. IV, f. 21.

Male. Brachypterous; length 2.5 mm.; tegmen 1.4 mm. Vertex very slightly longer than wide, apex slightly broadened and rounded; length

of face two and one-half the width, sides nearly straight, median carina simple; antennae reaching nearly to the middle of the clypeus, second joint one and one-half the length of the first; legs fairly long, hind femora reaching beyond apex of abdomen, tibiae longer than femora, tarsi shorter than tibia, first tarsus longer than the other two together. Tegmina reaching to apex of abdomen.

Opening of pygofer about as long as broad, round; anal segment with two short, thick spines far apart, genital styles medium size, flat, truncate at apex where they are broadest; aedeagus small, laterally compressed, comparatively short and broad, a row of eight teeth along the dorso-apical portion slightly on right side and another on the apico-ventral area slightly on the left side; functional orifice at apex.

Black or dark brown; antennae, carinae of head and thorax, metathorax, anal segment, trochanters, base and apex of tibiae and femora lighter brown or yellow. Tegmina hyaline, fuscous at apex of clavus and expanding in an irregular manner as a faint mark across the corium to costa, the darkest markings being at apex of clavus, near the base and at the apex of the costal cell; veins the same color as the membrane, granules minute with black hairs.

Female. Brachypterous; length 2.6 mm.; tegmen 2.0 mm. In coloration similar to the male.

*Habitat.* Olinda, Maui, 4200 feet elevation (*Giffard and Fullaway*, May 1918) on *Coprosma montana*. Described from eighteen males and twenty-three females. As is the case in many of these insects there is a considerable range of coloration. It follows the line of the extension of the yellow areas on the head and thorax and of the reduction of the fuscous in the tegmen. Some specimens, especially the females, are very light in color.

***I. stenogynicola* n. sp.** Pl. III, 5; Pl. IV, f. 22.

Male. Brachypterous; length 2.5 mm.; tegmen 1.7 mm. Length of vertex equal to the width at base, slightly narrowed towards apex, apex very slightly rounded; length of face nearly two and one-half times the width (1 to 2.4), very slightly narrowed at base, median carina simple, or forked at the extreme base; antennae not quite reaching to the middle of clypeus, first joint slightly shorter than second (1 to 1.3), legs moderately long, hind femora reaching to apex of abdomen, tibiae longer than femora, tarsi slightly shorter than tibiae, first tarsus slightly longer than the other two together. Tegmina reaching to apex of abdomen, apical cells well developed.

Opening of pygofer about as wide as long, sides slightly angular, anal spines short, stout, near together but not contiguous at base; genital styles moderately short, flat, broad, truncate at apex, narrowed at middle;

aedeagus tubular, slightly curved, tapering to a point at the apex, orifice near apex on ventral aspect, a row of six spines on right side from a dorsal position near apex to a ventral point about one-third from the base, the apical four are small, the fifth much larger, the basal or sixth spine largest, a similar row of spines run across the left side but two of the small spines are very small or missing.

Orange buff inclining to raw sienna, blackish between carinae of head and thorax, abdomen darker. Tegmina orange buff a dark mark at apex of clavus extending as a faint, broken, dark mark to near base of costa, costa dark on apical third, subcosta dark, and media and cubitus dark in middle, granules very small with black hairs.

Female. Brachypterous; length 3.5 mm.; tegmen 2.0 mm. Color similar to male but somewhat lighter over abdomen.

*Habitat.* Olinda, Maui, 4200 feet elevation (*Giffard* and *Fullaway*, May 1918) on *Stenogyne kamehamehae*. Described from seven males and three females.

This species is very distinct; it appears to go into the same group as *I. oahuensis* (Muir).

*I. kokolau* n. sp. Pl. IV, f. 4 a. b.

Male. Brachypterous; length 2.5 mm.; tegmen 1.8 mm.; length of vertex nearly one and one-half times the width (1 to 1.4), apex truncate with the median carina projecting, base considerably behind the middle of eye, sides subparallel; length of face twice the width, slightly narrowed at base beyond which the sides are subparallel, median carina furcate to near apex, near together but distinct; antennae reaching a little beyond the base of clypeus, first joint one-half the length of second; hind femora not reaching beyond apex of abdomen, tibiae longer than femora, tibiae slightly longer than tarsi, first tarsus slightly longer than other two together; tegmina reaching base of pygofer.

Anal spines short with wide bases which do not meet together; genital styles flat, outer margin nearly straight, inner margin emarginate on apical third, apex truncate; aedeagus subtubular on apical half, flattened laterally and widened on basal half, orifice on ventral aspect near apex, a few small spines near apex on dorsal aspect and a row of some ten spines from the same area across the right side to near the base, another row of spines from near orifice to near base along a ventro-lateral position on left side.

Ochraceous-tawny; claws, apex of rostrum and spines on legs darker, base of abdomen lighter. Tegmina hyaline, ochraceous-tawny, veins same color as membrane, granules very minute with dark hairs.

Female. Brachypterous; length 2.5 mm.; tegmen 1.8 mm. In coloration similar to the male.

*Habitat.* Ridge south of Iao Valley, West Maui (*Bridwell*,

September 1918) on *Campylothea* sp. Kokolau is the generic name by which the Hawaiians know the species of *Campylothea*. Described from one male and two females.

I place this species in the *cyrtandrae* group.

***I. curvata* n. sp.** Pl. IV, ff. 1, 3.

Male. Brachypterous; length 2.9 mm.; tegmen 2.1 mm. Length of vertex 1.6 times the width, sides parallel, apex slightly rounded, base well behind middle of eye (one-third from back of eye); length of face 2.6 times the width, slightly narrowed between eyes, sides slightly curved, median carina simple with the extreme base slightly thickened; antennae reaching beyond the middle of clypeus, second joint 1.5 times the length of the first; hind femora extending slightly beyond apex of abdomen, tibiae considerably longer than femora and considerably longer than tarsi, first tarsus longer than other two together; tegmina reaching to the base of pygofer.

Opening of pygofer round, dorsal emargination large, genital styles widened on basal half on inner margin and again slightly about one-third from apex, outer margin slightly concave, apex truncate, spines on anal segment long, slender and curved, their bases not near together, aedeagus shaped somewhat like a bishop's crosier with crook at the apex.

Buff-yellow, antennae brown, slightly fuscous between carinae of face and over the carinae of throat, tegulae and a spot on mesopleura brown. Tegmina buff-yellow with a brown mark at apex of clavus and another at apex of costal cell, veins the same color as the membrane with very minute dark granules bearing dark hairs.

*Habitat.* Lupe ditch, Maui, 1200 feet elevation (Giffard and Fullaway, May 1918) on *Cyrtandra* sp. Described from one male. The genitalia of this specimen is not in the best condition but it is quite distinct enough to warrant a description and name, as it is so very distinct from any other species described. For the present I place it near *I. blackburni* (Muir).

***I. acuta* n. sp.** Pl. IV, ff. 9, 11.

Male. Brachypterous; length 2.5 mm.; tegmen 1.6 mm. Vertex nearly as broad as long (1 to .9), apex slightly rounded, base at middle of eye, length of face nearly three times the width, slightly widest on apical half, median carina simple; Antennae reaching to middle of clypeus, second joint 1.4 times the length of first; hind femora not reaching beyond apex of abdomen, tibiae much longer than femora and than tarsi, first hind tarsus slightly longer than the other two together; tegmina reaching to base of eighth abdominal segment.

Opening of pygofer about as long as broad, dorsal emargination enclosing about half the anal segment, anal angles of pygofer not produced; anal segment with two short, stout spines; genital styles reaching nearly to the anal segment, flat, narrowest at middle, apex truncate, inner angle sharp, outer angle rounded; aedeagus tubular, straight, apex produced into an acute point, orifice on ventral aspect near apex, four spines on each side about one-third from apex, the more ventral ones the larger.

Pale orange yellow inclining to green; fuscous between carinae of head and thorax, apex of rostrum and claws of feet brown, slightly fuscous on dorsal aspect of abdomen. Tegmina pale orange yellow inclining to green in some specimens, a brown mark at apex of clavus and a small lighter mark at apex of costal cell, the dark mark at apex of clavus continuing as a faint infuscation across the tegmen to the base of costa, veins same color as membrane, no granules but a few fine, black hairs on veins.

Female. Brachypterous; length 2.7 mm.; tegmen 1.8 mm. The dark mark on tegmina not so pronounced as in the male.

*Habitat.* Ridge south of Iao Valley, West Maui (*Bridwell*, September 1st, 1918) on *Cyrtandra maricensis*. Described from three males and three females.

This species appears to be nearest to *I. osborni* but it is very distinct.

**1. waikamoiensis** n. sp. Pl. III, ff. 1, 8.

Male. Brachypterous; length 3 mm.; tegmen 1.7 mm. Vertex longer than broad (1 to 1.4), base of vertex at middle of eye, apex very slightly rounded and very slightly narrower than base; length of face 2.5 times the width, sides slightly curved, slightly widened on apical half, median carina simple, slightly thickened on basal third or very narrowly and indistinctly furcate there; antennae reaching beyond the middle of clypeus, first joint slightly shorter than second (1 to 1.3); legs long, hind femora longer than tarsi, first tarsus longer than other two together; tegmina reaching to base of pygofer.

Pygofer round, opening wider than long, dorsal emargination deep, nearly surrounding the anal segment, anal angles produced into a bluntly curved point; anal segment without spines; genital styles reaching nearly to anal segment; widest at base and apical third, apex pointed; the armature on phragma forming a long, narrow process standing up from the phragma, the dorsal edge being slightly emarginate where the aedeagus passes over it, the ventral edge rounded, the entire surface shagreened; aedeagus long, semitubular, curved, orifice at apex on dorsal aspect, a row of teeth on each side, that on the left being more dorsal than the right, slightly curved, the teeth slightly longer and their bases joined together forming a narrow flange.

Light orange yellow; between the carinae of face, third tarsi and claws, the medio-lateral portions of the abdominal tergites, pygofer and styles slightly blackish. Tegmina darker orange yellow, a black mark at apex of clavus, slightly fuscous across the middle of tegmina in which areas the veins are slightly darkened, a faint mark at apex of costal cell, granules minute with black hairs.

Female. Brachypterous; length 3.3 mm.; tegmen 1.9 mm. Tegmina reaching to base of seventh tergite. In color similar to male but slightly lighter, the mark between carinae of face being faint or absent.

*Habitat.* Waikamoi gulch, East Maui, 4000 feet elevation, and Puohakamoa, East Maui. Described from four males, three females and nymphs taken on *Cyanea aculeatiflora*, one male and one female on *Cyanea* sp. and one male and one female on *Pipturus* sp. (Rock, August 1918).

The young are orange yellow with dark claws, until the last stages when darker markings between carinae of face and on the tegmina begin to appear. This species comes into the same group as *I. wailupensis* (Muir) but it is quite distinct.

***I. pulla* n. sp.** Pl. III, f. 6; Pl. IV, f. 17.

Male. Brachypterous; length 1.6 mm.; tegmen .9 mm. Vertex wider than long (1 to .6), apex slightly rounded, sides parallel, base well before middle of eye (two-thirds from hind margin of eye); length of face 2.2 times the width, sides moderately curved, median carina furcate from near apex; antennae reaching beyond base of clypens, first joint half the length of second; hind femora not projecting beyond apex of abdomen, tibiae slightly longer than tarsi, first tarsus equal to the other two together; tegmina reaching to the middle of sixth segment.

Opening of pygofer a little wider than long, round; anal segment with two large spines near together at base; genital styles reaching nearly to anal segment, flat, widest at the base, narrowed about the middle, apex truncate; aedeagus strongly curved, base broad and laterally flattened, apex rounded, orifice on dorsal aspect near apex, four strong spines on right side on apical half, one on dorsal aspect near apex and four on left side.

Dark brown or nearly black, legs and base of abdomen lighter; tegmina brown, veins same color as membrane; no granules but some fine black hairs on veins also along apical margin.

*Habitat.* Mount Eke, West Maui, 5000 feet elevation (Rock, August) on *Argyrociphinum* sp. Described from one male. I place this species near *I. incommoda*.



**1. mauiensis** n. sp. Pl. III, f. 10; Pl. IV, f. 5.

Male. Brachypterous; length 2.2 mm.; tegmen 1.4 mm. Vertex slightly longer than wide, apex bluntly conical, length of face 1.8 times the width in middle, sides slightly arcuate, median carina simple; antennae reaching to base of clypeus, first joint about one-half the length of second (1 to 1.8); hind tibiae longer than tarsi, first tarsus equal to the other two together; tegmina reaching to near base of pygofer.

Clear dull green-yellow, old cabinet specimens being much yellower; eyes, claws, spines on legs, teeth on spur, genital styles, aedeagus and anal spines brown. Tegmina green-yellow, veins same color as membrane, a few minute black hairs irregularly placed mostly alongside the veins.

Pygofer and genital styles as in *I. raillardiae*, the anal spines are not diverging and much nearer together; the aedeagus is long, broad on basal third and subtubular on apical two-thirds, orifice on the ventral aspect of apex, a row of eight broad spines runs along the right side from about the middle to the dorsal aspect of apex, a row of six along the ventral aspect of the apex with two or three small ones on the left side near apex.

Female. Brachypterous; length 2.1 mm.; tegmen 1.3 mm. In coloration similar to male.

*Habitat.* Wailuku Common, Mani (*Giffard and Fullaway*, May 1918) on *Campylotheca mauiensis* and three specimens from *Lipoechaeta integrifolia*. Described from sixtyfour males, eighty females and a number of nymphs. This species comes next to *I. incommoda* (Muir) from which it differs chiefly in the shape of the aedeagus.

This was originally described from a single male specimen with a broken aedeagus. I now have one male and five females from near the summit of Haleakala, Mani (*Bridwell*, August 1918) on *Raillardia menziesii* which I consider to be this species. The aedeagus is figured.

**1. osborni** (Muir). Pl. IV, f. 6.

This was originally described from a single male specimen with a broken aedeagus. I now have one male and five females from near the summit of Haleakala, Mani, (*Bridwell*, August 1918), which I consider to be this species. The aedeagus is figured.

Length of vertex 1.5 times the width, sides subparallel, apex slightly rounded, base about middle of eye; length of face double the width,



sides very slightly curved, median carina simple; antennae reaching slightly beyond base of clypeus, second joint slightly less than twice the length of the face. Tegmina reaching to base of pygofer.

***I. neocyrtandrae* n. sp.** Pl. III, f. 9; Pl. IV, f. 7.

Male. Brachypterous; length 2.7 mm.; tegmen 1.6 mm.; length of vertex equal to width at base, apex slightly narrower, slightly rounded; length of face 2.3 times the width in middle, sides very slightly curved, median carina simple; antennae reaching to middle of clypeus or slightly beyond, second joint 1.3 times the length of first; legs long, first tarsus longer than the other two together; tegmina reaching to the base of seventh segment.

Opening of pygofer large, sub-diamond shape, dorsal edge deeply emarginate for the reception of anal segment which is "lipped" and has two short, thick spines on the ventral surface near together and pointing basad; genital styles large, reaching to anal segment, in full view they are narrow, straight and truncate at apex, in lateral view broad at the base, concave on the outer edge with a wide subangular projection about one-third from the truncate apex; aedeagus long, narrow and produced to an acute apex, orifice near apex on ventral aspect, a row of seven or eight short spines runs from the apex for about one-third of the length on each side, near to the orifice.

Sepia or bister; carinae of head, antennae, legs, base and middle of dorsum of abdomen lighter clay color; tegmina light clay color with a dark mark at apex of clavus and light fuscous from there to the base of costal cell, veins darker with very minute granules with fine black hairs, the apical margin and the apical veins much lighter.

Female. Brachypterous; length 3.2 mm.; tegmen 1.8 mm. In color on the average lighter than the male.

*Habitat.* Waikamoi trail, East Maui, 4000 feet elevation (Rock, August 1918) on *Gunnera petaloides*. Described from thirty-three males and fifty-six females.

By the genitalia this species comes near to *I. cyrtandrae*, the anal spines are much shorter, the row of spines on the aedeagus not so numerous and do not reach so far basad, the genital styles are narrower and the narrow apical portion much longer. In the series of 89 specimens there is not a great variation in color, a few specimens are slightly lighter than the type, more so among the females. The nymphs have the two median frontal carinae and the first joint of antennae very short, as is usual in this genus; the head, tegminal pads and apical portion of the abdomen are dark, the rest light.

**I. mamake** n. sp. Pl. IV, f. 8.

Male. Brachypterous; length 2.5 mm.; tegmen 1.8 mm.; vertex as long as broad, apex very slightly rounded; length of face nearly three times the width (1 to 2.8), sides subparallel, median carina simple; antennae reaching to the middle of clypeus, first joint half the length of the second; legs long, hind femora reaching well beyond apex of abdomen, tibia longer than femora, first tarsus longer than the other two together; tegmina reaching to base of pygofer.

The opening of pygofer large, slightly angular at sides, dorsal emargination large enclosing about two-thirds of anal segment; anal segment slightly lipped, two large, slender, slightly curved spines near together at base, directed basad and not visible when anal segment at rest; genital styles large, reaching nearly to anal segment, broad, flat, apex truncate with corners slightly produced, slightly angled at middle; aedeagus long; thin, subtubular, widest at base where it is slightly flattened laterally, slightly enlarged before apex which is pointed, orifice on ventral aspect at apex, three spines on the right side, in a dorso-lateral position near apex, over the ventral aspect and left side on the apical half there are some sixteen small spines, several being bunched together slightly basad of the orifice.

Black; antennae, carinae of head, genae beneath transverse carina, carinae and lateral and posterior edges of pronotum, legs, base and middle of abdominal tergites ochraceous tawny. Tegmina ochraceous, veins black except at extreme base and apex and over cross-veins, the black spreading out into the membrane, the apical margin, apical veins and cross-veins white or light ochraceous, granules very minute, sparse and bearing fine black hairs.

Female. Brachypterous; length 3.8 mm.; tegmen 2.1 mm. Tegmina reaching to eighth tergite. In color the female is lighter than the male, the light color of the carinae extending further afield.

*Habitat.* Waikamoi gulch, East Mani, 4000 feet elevation (Rock, August 1918) on *Pipturus* species (native generic name *Mamake*).

Described from nineteen males and fifteen females. The half grown nymphs have two median carinae, and the basal joint of antennae is annular; their color is ochraceous with blackish markings between the carinae of head and thorax, and over the middle of tegminal and wing pads.

This species is quite distinct by the genitalia, it comes into the same group as *I. oahuensis* (Muir).

***I. raillardiicola* n. sp.** Pl. IV, f. 14.

Male. Brachypterous; length 2.4 mm.; tegmen 1.5 mm.; vertex as broad as long, slightly widened at apex where it is slightly rounded, base at middle of eye; length of face 1.9 times the width, median carina simple but broadened and indistinct at the base; antennae reaching slightly beyond base of clypeus, first joint half the length of second; hind femora reaching to the apex of abdomen, femora longer than tarsi, first tarsus equal to the other two together; tegmina reaching to end of abdomen.

Opening of pygofer a little broader than long, dorsal emargination large, embracing half the anal segment; spines on anal segment large, broad at base, diverging; genital styles near to those of *I. tetramalopii* with the angulation on the inner edge more pronounced, aedeagus flattened laterally, apex bluntly pointed, orifice near apex towards the left side, a row of fine spines along the dorsal aspect inclining to the right side, another row of some six spines on ventral aspect with three spines on the right side at the distal end of the ventral row, and two or three small spines on the left at the distal end of the dorsal row.

Head and thorax black or very dark brown, antennae, clypeus and carinae lighter, coxae and abdomen dark, legs, base of abdomen and anal segment lighter. Tegmina hyaline, light ochraceous, a brown mark from apex of clavus over the middle of tegmen to near base of media, another small mark at apex of costal cell, veins concolorous as membrane, no granules but a few very fine black hairs, margins light except at the apex of clavus. The tegmina are slightly raised or humped on the margins of clavus.

Female. Brachypterous; length 2.7 mm.; tegmen 2.0 mm. Tegmina reaching to apex of abdomen. Uniformly ochraceous orange, inclining to brown over the head and thorax.

*Habitat.* Haleakala, Maui, from 7000 to 8000 feet elevation (*Bridwell*, August 1918) on *Raillardia menziesii* and *Raillardia platyphyllum*. The nymphs are ochraceous orange, brownish over the head and thorax.

Described from seven males, twenty-one females and three nymphs.

There are also five males and six females from the same locality collected by Swezey.

***I. painiu* n. sp.** Pl. IV, f. 16, a. b. c.

Male. Brachypterous; length 2.9 mm.; tegmen 1.8 mm.; length of vertex 1.5 times the width, slightly wider at the apex which is slightly rounded, base slightly behind the middle of eye; length of face twice the width, sides slightly curved, median carina furcate from near apex, the space between the forks raised so that it appears more as a wide carina than as two; antennae extending well beyond base

of clypeus, first joint half the length of second; hind femora not extending beyond the apex of abdomen, tibia slightly longer than tarsi, first tarsus considerably longer than the other two together (1 to 1.4); tegmina reaching to base of seventh segment.

Opening of pygofer large, about as wide as long, dorsal emargination embracing about one-half of the anal segment, anal segment with two long, straight, slender spines far apart at base; genital styles flat, narrow, slightly narrowed in middle, apex truncate; aedeagus slightly flattened laterally, bent in the middle to an angle of about 35 degrees, narrowest at the bend, orifice situated on a latero-dorsal aspect on the right side slightly before apex, a row of small spines on each side from the orifice to near the bend.

Light orange yellow, black between carinae of face, clypeus and genae, brownish on sides of pronotum, between carinae of mesonotum, over coxae, pleura and the lateral portions of abdominal tergites and sternites. Tegmina hyaline, light orange yellow, a dark mark at apex of costal cell and another at apex of clavus with a slight infuscation from the apex of clavus to base of costal cell, veins same color as membrane, no granulations but a few fine black hairs. The second male specimen has a darker head, the basal joint of the antennae as well as vertex and carinae of face being all dark.

Female. Brachypterous; length 3 mm.; tegmen 1.8 mm. In color much lighter than the male, being nearly uniformly light orange yellow, infuscate over head and basal joint of antennae.

*Habitat.* Ridge south of Iao Valley, Maui (*Bridwell*, September 1918) on *Astelia veratroides* (native name painin). Described from two males and two females. This species is near to *I. nesogunnerae* (Muir).

***I. coprosmicola* n. sp.** Pl. IV, f. 18.

Male, brachypterous. Width of vertex at base equal to length, apex slightly narrower than base, slightly rounded; length of face twice the width, narrowest between eyes, median carina forked at extreme base; antennae reaching to near middle of clypeus, second joint twice the length of first; tegmina reaching to base of pygofer; first hind tarsus slightly longer than the other two together.

Dark brown or black; carinae of head, antennae, rostrum, legs, base of abdomen and anal segment yellowish or light brown. Tegmina hyaline, a dark brown mark at apex of clavus broadening out into a light fuscous band across tegmen from apex of costal cell to near base, being much fainter over the basal portion of costal cell, veins same color as membrane, granules very minute with black hairs.

Opening of pygofer deeper than broad, margins entire, dorsal emargination deep with anal segment sunk into the emargination, anal spines large, curved basad, wide apart; genital styles large somewhat like those of *blackburni* but with the apex more oblique; aede-

gus figured from right side, no spines on left side except along ventral aspect and a bunch of smaller ones near apex.

Length 2.2 mm.; tegmen 1.5 mm.

Female, brachypterous. Similar in color to the male.

Length 2.9 mm.; tegmen 1.8 mm.

*Habitat.* Olaa, 27 miles, Hawaii (W. M. Giffard, August 1918) on *Coprosma ernodioides*. Described from nine males and ten females and some nymphs which are dark brown with some lighter markings. There is but little variation in color in the type series.

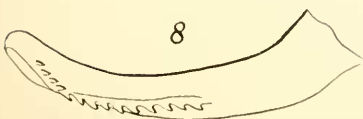
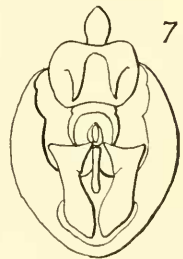
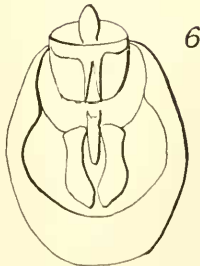
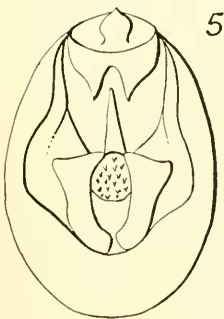
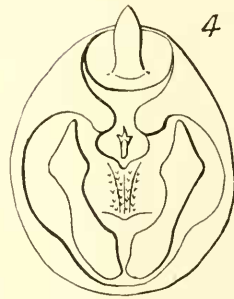
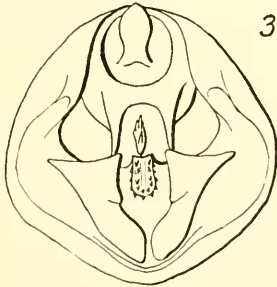
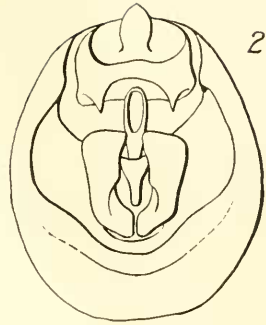
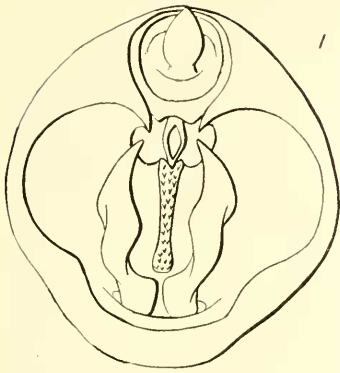
***I. ulehihi* n. sp. Pl. IV, f. 12.**

Male, brachypterous. Length of vertex slightly greater than the width, apex slightly rounded, base at middle of eye; length of face 3.3 times the width, narrowest between eyes; antennae reaching well past the middle of clypeus; first joint shorter than the second (1 to 1.4); legs long, first hind tarsus longer than the other two together; tegmen reaching base of eighth segment.

Vertex, thorax and abdomen black, face light brown with the carinae and a thin longitudinal line between carinae brown, antennae, rostrum and legs brown, metathorax and base of abdomen salmon color. Tegmina hyaline, light brown, a black mark at apex of costal cell, another and larger one at apex of clavus which continues as a lighter mark diagonally to near the base of subcosta, veins at base and apex light brown, in middle fuscous, granules minute with black hairs.

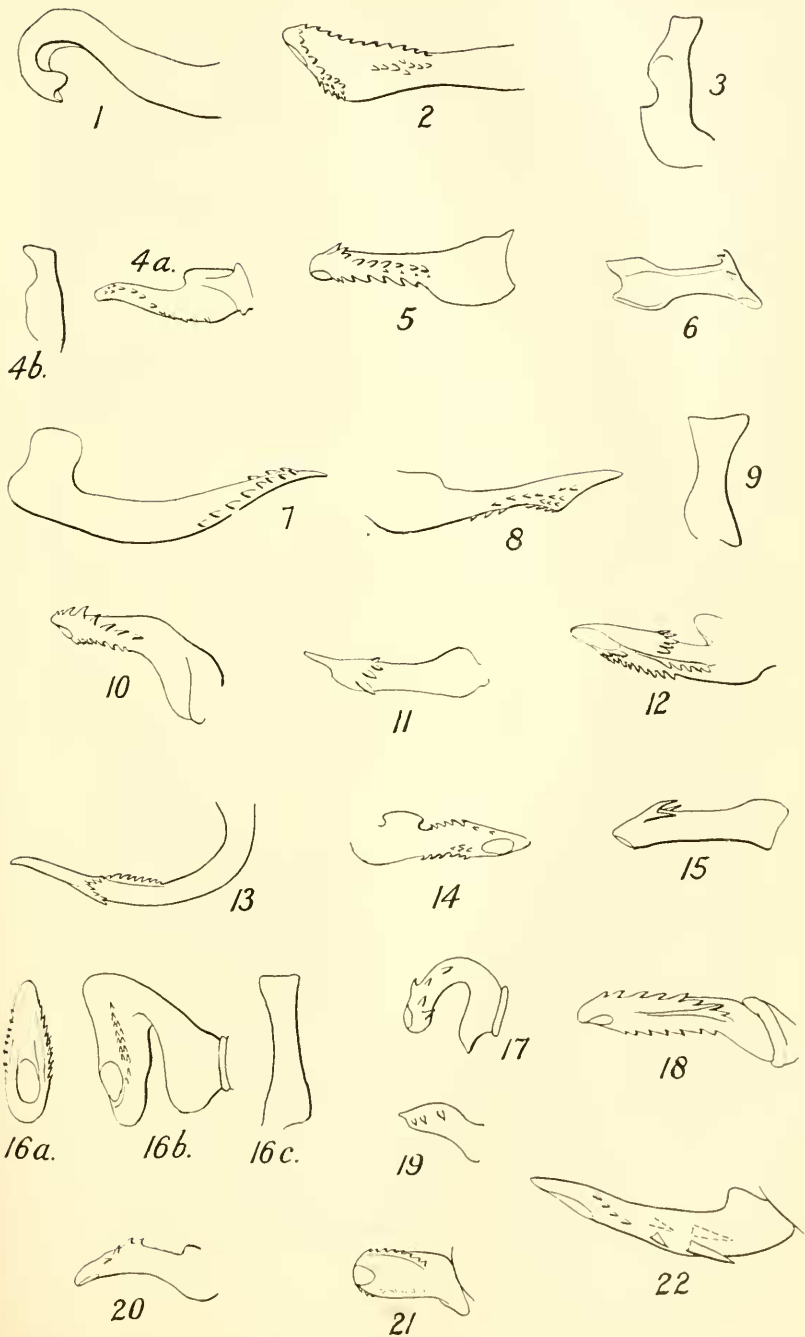
### EXPLANATION OF PLATE III.

- Fig. 1 *Ilburnia waikamoensis*, pygofer full view.  
 Fig. 2 *Ilburnia coprosmae*, pygofer full view.  
 Fig. 3 *Ilburnia bridwelli*, pygofer full view.  
 Fig. 4 *Ilburnia longipes*, pygofer full view.  
 Fig. 5 *Ilburnia stenogynicola*, pygofer full view.  
 Fig. 6 *Ilburnia pulla*, pygofer full view.  
 Fig. 7 *Ilburnia tetramalopii*, pygofer full view.  
 Fig. 8 *Ilburnia waikamoensis*, aedeagus, right side.  
 Fig. 9 *Ilburnia neocyrtlandrae*, genital style.  
 Fig. 10 *Ilburnia mauiensis*, genital style.



## PLATE IV.

- Fig. 1 *Ilburnia curvata*, aedeagus, right side  
Fig. 2 *Kelisia eragrosticola*, aedeagus, right side.  
Fig. 3 *Ilburnia curvata*, right genital style.  
Fig. 4 *Ilburnia kokolau* (a.) aedeagus, right side;  
(b.) right genital style.  
Fig. 5 *Ilburnia mauiensis*, aedeagus, right side.  
Fig. 6 *Ilburnia osborni*, aedeagus, left side.  
Fig. 7 *Ilburnia neocyrlandrae*, aedeagus, left side.  
Fig. 8 *Ilburnia mamake*, aedeagus, right side.  
Fig. 9 *Ilburnia acuta*, right genital style.  
Fig. 10 *Ilburnia monticola*, aedeagus, right side.  
Fig. 11 *Ilburnia acuta*, aedeagus, right side.  
Fig. 12 *Ilburnia ulchihii*, aedeagus, right side.  
Fig. 13 *Kelisia sporobolicola*, aedeagus, right side.  
Fig. 14 *Ilburnia raillardicola*, aedeagus, left side.  
Fig. 15 *Ilburnia longipes*, aedeagus, right side.  
Fig. 16 *Ilburnia painia* (a) aedeagus, end view; (b) right side  
view; (c) genital style.  
Fig. 17 *Ilburnia pulla*, aedeagus, right side.  
Fig. 18 *Ilburnia coprosmicola*, aedeagus, right side.  
Fig. 19 *Ilburnia tetramalopii*, aedeagus, right side.  
Fig. 20 *Ilburnia bridwelli*, aedeagus, right side.  
Fig. 21 *Ilburnia coprosmae*, aedeagus, right side.  
Fig. 22 *Ilburnia stenogynicola*, aedeagus, right side.





Opening of pygofer about as broad as long, dorsal emargination large, anal segment sunk well into emargination but not surrounded, anal spines not visible from external view, but are large, touching at base and slightly diverging; genital styles somewhat similar to those of *I. bridwelli*, the projection in the middle of the inner margin more prominent, and a projection on inner edge at base; aedeagus figured from right side, the dorso-median row of spines on the right side continues distad on the left near the dorsal line, otherwise there are no spines on the left side.

Length 3.6 mm.; tegmen 2.2 mm.

Female, brachypterous. In color similar to male.

Length 4.5 mm.; tegmen 2.8 mm.

*Habitat.* Olaa, 27 miles, Hawaii (W. M. Giffard, June 1918) on *Smilax sandwicensis*, the native name of which is Ulehiihi. Described from three males and three females.

#### *I. blackburni* (Muir.)

Three males and four females from Waikamoi gulch, East Mani, 4000 feet elevation (Rock, August 1918) on *Cyanea hammatifolia*. In color these specimens are similar to some of the specimens from Hawaii, the males having a black or very dark pronotum and mesonotum. The small comb of teeth on the ventral sides of the median orifice is more definite than in the Hawaii specimens.

#### *I. wailupensis* (Muir.)

*Aloha wailupensis* Muir. Proc. Haw. Ent. Soc. III,  
p. 181 (1916).

The median facial carinae join together near the apex. This should be placed in *Ilburnia* and not *Aloha*. This necessitates giving a new name to *Nesosydne wailupensis* Muir, for which I propose *Ilburnia neowailupensis*, new name.

#### *I. lobeliae* (Muir.)

One male and two females on *Kadua glomerata* from Mount Olympus, Oahu (Timberlake, September 1918). The large, flat spine on the anal tube has two small spines near the apex the type having but one.